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	First Named Inventor	Joudahl	
	Art Unit	2859	
	Examiner Name	Verbitsky	
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November 21, 2005

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Application No. 10/694,202
Filed: Oct 27, 2003
Title: Method and Device

Art Unit 2859
Examiner Verbitsky

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Sir: **Amendment & Response to an Office Action**

In response to the Office Action mailed Aug. 23, 2005, initially rejecting Claims 10-14 in the pending application, please consider the following.

Claim Objections

The Examiner has objected to Claim 10 because of an informality, viz., the absence of the word "located" to aid in describing where the temperature sensing means is positioned. Applicant will authorize the amendment of Claim 10 accordingly.

Claim Rejections

Claims 10 and 12-14 are rejected under 35 USC 103(a) as obvious over Hutchinson (USP 6,393,212) in view of Starnier et al. (6,386,272).

Essentially, Hutchinson describes a small, portable steam generating system for providing super-heated steam to a surface cleaning apparatus. As the Examiner points out, the Hutchinson generator 10 has a heating element 15 for heating water and generating steam.

Furthermore, Hutchinson has a microprocessor control system 22 that monitors steam temperature through transducer 90, steam pressure through transducer 92 and internal heater coil 15 through transducer 94 (col. 10, line 33). However, in lines 46 and 47, Hutchinson alleges that the temperature within heater 15 is controlled via thermocouple 94. Regardless of whether Hutchinson teaches using a thermocouple or a transducer, neither is being used as a sensor and neither could be used in the claimed device.

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Hutchinson refers to 94 as both a thermocouple and a transducer. Applicant would point out that a transducer cannot sense temperature change and that Hutchinson's reference to "transducer" is incorrect and that the term "thermocouple" should have been used. Thus, Hutchinson is using either a thermocouple or a transducer 94 to actuate a fuse or a relay that de-energizes power to the heater coil 15 to prevent the heater coil from over heating. Applicant is using the sensor in the claimed device to detect a gradual change in temperature within the sensor to indicate an altered state within a liquid system.

The Examiner observes that Hutchinson states that the heater 15 surface is susceptible to calcium (scale) build-up. Actually, Hutchinson mentions in Claim 9, of all places, that microboiling at the surface of the heater element 15 is prevented by the turbulence created by the baffles and "scouring of the heater surface to minimize build-up of calcium on heater surface." Applicant is not sure what that means, but Applicant is willing to concede that calcium accumulation in the form of scale is a recognized problem in boilers, dishwashers and all other heated liquid systems.

And although Applicant does not see where Hutchinson states that the walls of the boiler are susceptible to scale accumulation, as observed by the Examiner, such a condition would not be surprising because as stated above, scale is a recognized problem in heated liquid systems. Still, Hutchinson does not address scale accumulation on the walls of the boiler.

And, finally, with regard to Hutchinson, the Examiner notes that Hutchinson does not explicitly teach to detect the build-up/accumulation (altered state). Applicant, of course, agrees with this observation.

With regard to Starnier et al. (hereinafter "Starnier"), the Examiner suggests that "Starnier discloses in Fig. 4 a device in the field of applicants endeavor comprising a temperature sensor 52 within a tube and leads (signal means) also at least partially located within the tube and providing a temperature indicative signal to a control device (fouling calculation). This signal, along with signals from other temperature sensors is indicative of a temperature, and thus, any temperature change indicative of an altered state (fouling/build-up, accumulation of scale) to, inherently, alert or notify the operator of controlling device." [sic]

Then the Examiner adds that it would have been obvious to one of ordinary skill in the art to modify the device of Hutchinson-- "to measure temperature profile of the tubes, as taught by Starnier, so as to use the temperature sensor with the leads (signal means) within the tube and use the data not only for sensing the temperature within the tube, but also for determining a fouling (accumulation/build-up/deposit) in the tube, so as to allow the operator to take necessary actions to minimize the accumulation of scale, in order to protect the device from damage." [sic]

Applicant respectfully disagrees with the Examiner's characterization that the combined teachings of Hutchinson and Starner obviate the claimed invention.

The claimed invention consists of a tube containing a heating means, a temperature sensing/detecting means and a signal means working in concert to detect and indicate an increase in temperature within the tube.

In use, the claimed device is placed in a liquid system, for instance, a water heater. The internal heat source within the tube establishes a base-line temperature within the tube. As the liquid system operates, typically, over a period of months, conditions within the liquid system change. In almost all instances, those changed conditions, e.g., scale accumulation, will cause the temperature of the liquid system to decrease, thus diminishing the efficiency of the system. Because the claimed device is placed within the liquid system, scale will also build-up on the exterior of the claimed device just as it does throughout the system. This accumulated scale will act as an insulator, trapping heat from the internal heating means and not allowing it to escape or radiate from the device. As the scale continues to accumulate, becoming thicker on the exterior of the claimed device, the trapped heat will cause an increasingly higher temperature within the device, and the higher temperature will be detected by the internal heat sensor/detector means, which will, in turn, generate a generally recognized signal indicating the altered condition and need for an appropriate response.

In its most relevant teaching, the Hutchinson reference describes a steam generating system comprising a cylinder 10 and a heating body 15 for heating the water in the cylinder 10 to generate steam. The internal temperature of the heating body 15 appears to be governed by a thermocouple or transducer 94. The purpose of the thermocouple/transducer 94 is to prevent the heating body 15 from overheating. It monitors nothing but a threshold temperature, at which time or point it shuts off energy to the heater 15.

The claimed device is a tube containing a heating means to establish and maintain a constant or base-line temperature within the device. The heating means of the claimed device is very small. It neither heats nor is it intended to heat or increase the temperature of the water in the liquid system in which the claimed device is placed. The heating means is used in conjunction with its own internal sensing device to establish a baseline temperature. The sensing means within the tube continuously monitors the temperature within the tube, and when scale accumulation on the outside of the tube causes the internal temperature to reach a predetermined level, a signal means within the tube sends a detectable signal to alert the operator of the system of the existence of an altered state.

The Starner device is essentially a heat exchanger having two sensors: a temperature sensor 30 on the tube wall surface and sensor 50 inside the tube. According to Starner, the temperature difference between the tube wall and the water within the tube is a measure of the change of thermal resistance in the tubes caused by fouling.

The differences between Starner and the claimed device are significant and numerous. It is important to note that the two sensors of Starner take pairs of readings at predetermined intervals to provide differential data that are transmitted by leads to a processor for calculation and determination if fouling exists.

In contrast to Starner, the claimed device is always functioning. In the claimed device, the heating means is establishing and maintaining an internal temperature; the sensing means is monitoring to detect temperature changes within the device and a signal means remains poised to alert the operator when the increase in temperature is sufficient to indicate an altered state in the liquid system.

The Examiner's conclusion that it would have been obvious to one skilled in the art to modify the device of Hutchinson to measure the temperature profile of tubes as taught by Starner is not logical. Hutchinson, at the very most, suggests that the turbulence in his boiler created by his baffles might scour the surface of his heater 15 to minimize the accumulation of scale. Hutchinson has arguably solved his scaling problem. Hutchinson has no interest or need in taking paired temperature readings, either on or within his heater. So, not only is there no reason or motivation for augmenting the teaching of Hutchinson with the teaching of Starner, but the resulting device would neither resemble nor suggest the claimed device.

Stated differently, Hutchinson has no need to monitor changes in temperature. Hutchinson needs to detect when an elevated, and arguably dangerous, temperature is reached so that his heater will shut down. Introducing the paired sensors of Starner into the Hutchinson device accomplishes nothing. Hutchinson does not need differential temperature readings. Hutchinson needs a temperature sensitive device (thermocouple) to cause a "break" when a threshold temperature is attained to protect his boiler.

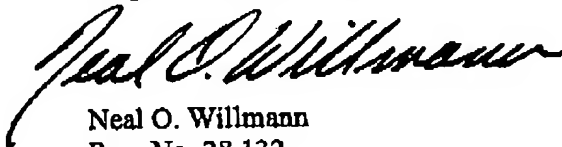
The Examiner has also rejected pending Claim 11 under the authority of 35 USC 103(a) as obvious in view of the combined teachings of Hutchinson and Starner as applied to Witt et al. (US Patent 6,428,627, hereinafter, Witt).

With regard to the rejection of Claim 11, the Witt reference relates to externalizing the heating element in a dishwasher to eliminate scale build-up or accumulation. The teaching in Witt has absolutely no relevance to a dishwasher (the liquid system of Applicant's Claim 11) equipped with the device defined by Applicant's Claim 10, especially as distinguished from the combined teachings of Hutchinson and Starner as set forth above.

To summarize, Applicant respectfully disagrees with the Examiner's conclusions that combined teachings of Hutchinson and Starner would lead anyone to devise the claimed device. Hutchinson has solved his scaling problem with baffles and Starner takes periodic, paired temperature readings on the cooling tubes of a heat exchanger. These are totally different applications using heaters and sensors and they cannot be rationally combined or interchanged to effect the claimed device.

Applicant respectfully requests that the Examiner reconsider her rejection of the pending claims and, after reconsideration, find all claims, especially as amended herein, allowable over the prior art. A Notice of Allowance is requested.

Respectfully submitted,



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